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ALLOCATION OF INDIRECT COSTS

Industry requires an accurate allocation of indirect costs to final cost objectives, such as commercial products or specific government contracts, for numerous reasons. From a financial reporting perspective, it is necessary for the proper valuation of inventories and for determining business segment profitability. From a management perspective, it is necessary for controlling costs and for internal decision-making purposes, such as product pricing and capital investment decisions. In addition, in order to do business with the government on a negotiated cost basis, defense contractor management must have accurate cost and pricing data necessary for compliance with government contracting requirements. From a program management perspective, the method used to allocate indirect costs will determine the amount of those costs that will be charged to each contract.

ALLOCATION OF OVERHEAD

For overhead cost allocation purposes, companies look at overhead on an annual basis and it is considered to be a "period" expense. The period used is the contractor's fiscal year, because it provides a natural business cutoff for expenses. Consequently, this period usually never coincides exactly with any government contract period of performance. There are many reasons why businesses view overhead on an annual basis. Many overhead type expenses will vary significantly from month to month. Changes in business volume from month to month could significantly affect overhead rates. Seasonal variations, such as heating and air conditioning requirements, cause large month-to-month differences. Month-to-month estimates are required for hundreds of indirect expenses in each overhead pool, and they can never be precisely correct. For example, detailed inventories of the many indirect materials and supplies cannot be made each month in order to know the actual amount used during a monthly production period. Many estimates must be made because management cannot wait until the end of the year to find out what each job costs. Further, many jobs will be completed before the year ends and customers are continuously requesting proposals and quotations that must include indirect costs. Therefore, overhead is estimated at the beginning of the year and applied to each job or product worked on during the year. The basic idea of this approach is to use an average estimated overhead cost without changing the overhead rate in costing specific jobs, products, or contracts from day to day or month to month. Again, overhead is managed in annual increments based upon the contractor's fiscal year.

The concept of a predetermined, "applied overhead rate" is used in industry for allocating overhead costs, for estimating purposes, and for costing jobs completed prior to the end of the year when actual costs will be known. The applied overhead rate is the ratio of estimated indirect costs for the contractor's fiscal year to the estimated business volume for some common, measurable, direct cost allocation base factor for the same period. To correct a common misunderstanding, we note that although "forward pricing rates" are commonly referred to as "applied rates," they are not the same rates. Forward pricing rates are used only for gov-

ernment contracting purposes and the contractor's applied rates have not been reduced for many costs that the government will not pay. The applied rates represent the contractor's best estimate of what he expects his total costs to be, including any unallowable expenses. The contractor's applied rates will always be greater than the rates used for government contracting purposes. We will discuss forward pricing rates later after we have addressed government requirements for allowability of indirect costs in Chapter 6.

The basic formula for all indirect cost rates is:

$$\text{rate} = \frac{\text{indirect cost pool expenses}}{\text{allocation base}}$$

In computing overhead rates, the estimated indirect costs in each cost pool is the numerator and the estimated direct specific allocation base for that cost pool is the denominator. The predetermined rate should produce an equitable allocation of indirect costs among numerous final cost objectives, such as government contracts. The estimated rate is applied to the incurred cost on each job on a cumulative basis each accounting period. Of course, there will always be a difference between the overhead costs generated by applying the predetermined estimated rate and the actual overhead costs. The estimated overhead rates are adjusted to actual rates as soon as the actual data are known at the end of the accounting period.

Each direct allocation base is calculated based on a projection of the forecasted direct activity which, in turn, is derived from the estimated sales for the same period. The estimated sales are the total sales for both government and commercial business. Any significant error in estimating sales will result in a significant error in the predetermined rate. Therefore, the accurate development of the business base is very crucial to the rate development process. We will discuss the very important subject of sales forecasting, which is crucial to the management of overhead costs, in greater detail in Chapter 5.

The direct allocation base selected for a given overhead cost pool must be common to all contracts worked on as it becomes the measuring device for allocating joint, indirect costs to contracts. On a historical basis, the most common method of applying overhead costs has been direct labor cost. Direct labor cost has been used because it is readily available from business records and because it has traditionally been such a large, common, direct cost component of total costs. The importance of direct labor as an allocation base is changing and later we will discuss this change in more detail.

Exhibit 6, "Final Overhead Rates," takes a more detailed look at the computation of overhead rates in a large company. It shows the overhead rates that would apply to the eight overhead pools in our example of a typical defense contractor. For educational purposes, we used direct labor dollars as the basis for allocating the indirect cost for all overhead pools except material handling, where direct materials was considered to be a more appropriate allocation base. For example, in recovering the indirect costs associated with particular contracts during the year, each dollar of engineering direct labor worked on a contract will be burdened with an engineering overhead of 125.95%. In addition, the engineering direct labor and overhead, plus any added labor and overhead that may be applicable to work on the contract from other cost pools, will be burdened with general and administrative expenses; however, a G&A rate cannot be computed in our example until total IR&D/B&P expenses are computed and transferred into the G&A cost pool. The necessity for this transfer will become clear later when we discuss the methodology for allocating G&A expenses.

INDIRECT COSTS	ENG	FAB	ASSY	TOOLING	MATERIAL HANDLING	PRODUCT "A"	PRODUCT "B"	OFF SITE	G&A
Salaries & Wages:									
Supervision	$ 3,701	$ 19,674	$ 6,246	$ 729	$ 4,235	$ 177	$ 301	$ 260	$ 21,982
Supervision	$ 3,701	$ 19,674	$ 6,246	$ 729	$ 4,235	$ 177	$ 301	$ 260	$ 21,982
Indirect Labor	33,310	91,811	28,105	4,666	33,876	694	1,157	1,214	88,636
OTP	925	18,362	4,164	198	42,345	59	141	87	2,836
Training	5,552	1,202	520	255	2,879	231	347	130	2,978
Idle Time	19	219	104	24	85	1	2		
Total Salaries & Wages	$ 43,507	$ 131,267	$ 39,139	$ 5,872	$ 83,420	$ 1,162	$ 1,948	$ 1,692	$ 116,432
Fringe Benefits:									
Health & Life Ins	$ 29,609	$ 40,768	$ 17,175	$ 4,008	$ 6,288	$ 1,851	$ 3,701	$ 1,388	$ 1,595
Workmen's Comp	1,851	31,041	12,491	1,093	5,336	116	231	173	4,432
Annual Leave	7,402	8,744	4,164	972	2,287	463	925	347	3,900
Holiday	9,253	10,930	5,205	1,214	1,906	578	1,157	434	2,482
Sick & Pers Lv	3,701	7,651	3,123	559	953	231	463	173	1,773
FICA Taxes	14,804	17,488	8,327	1,943	3,049	925	1,851	694	1,578
Unempl Taxes	1,851	2,186	1,041	243	381	116	231	87	1,064
Retirement Plan	16,655	19,674	9,368	2,186	3,430	1,041	2,082	781	2,570
Savings Plan	3,701	4,372	2,082	486	762	231	463	173	2,322
Total Fringe Benefits	$ 88,827	$ 142,853	$ 62,977	$ 12,703	$ 24,391	$ 5,552	$ 11,103	$ 4,250	$ 21,716
Supplies/Svcs:									
Operating	$ 925	$ 18,624	$ 6,402	1,241	4,235	29	35		106
Maintenance	37	1,093	520	121	898	5	12		21
Perishable Tools	1,110	9,181	4,372	1,020	51	30	8		
Cal & Cert	370	656	312	73	34	23	46		
Office Supplies	925	874	427	97	728	60	46		1,950
Total Supplies/Svcs	$ 3,368	$ 30,429	$ 412,033	$ 2,553	$ 5,945	$ 147	$ 148		$ 2,078
Other Expenses:									
Travel	$ 7,032	$ 1,749	$ 833	$ 194	$ 8,469	$ 160	$ 319		$ 8,864
Telephone	4,626	1,093	520	121	1,186	289	578		10,016
Busn Meetings	925	66	31	20	593	60	21		1,773
Employee Relocation	555	44	21	5	102	40	81		124
Dues & Subscriptions	370	46	21	8	31	18	35		1,773
Employee Welfare	185	334	159	37	38	23	46		121
Total Other Expenses	$ 13,694	$ 3,331	$ 1,585	$ 386	$ 10,418	$ 590	$ 1,081		$ 22,669
Allocations:									
Use & Occupancy	$ 60,653	$ 98,423	$ 31,705	$ 13,785	$ 27,845	$ 3,860	$ 7,719		$ 31,705
Computing Svcs	22,465	14,145	4,160	2,496	14,145	1,165	1,331		23,297
Operations Svcs	556	33,381	20,665	2,384	18,280	397	636		3,179
Industrial Eng		5,464	2,484	1,987					
Total Allocations	$ 83,675	$ 151,413	$ 59,014	$ 20,652	$ 60,270	$ 5,422	$ 9,687		$ 58,181
Total Indirect Expenses	$ 233,070	$ 459,294	$ 174,748	$ 42,165	$ 184,445	$ 12,874	$ 23,966	$ 5,942	$ 221,076
Allocation Base DL$	$ 185,055	$ 218,597	$ 104,094	$ 24,289		$ 11,566	$ 23,132	$ 8,674	
Allocation Base DM$					$ 1,693,812				
Overhead Rates	125.95%	210.11%	167.88%	173.60%	10.89%	111.31%	103.61%	68.50%	(1)

(1) The G&A rate cannot be computed until IR&D/B&P costs are transferred into the G&A cost pool (see Exhibit 7).

Exhibit 6. Final Overhead Rates (In Thousands)

Engineering DL$		$ 60,000
Engineering OH	125.95%	75,568
Fabrication DL$		72,000
Fabrication OH	210.11%	151,279
Assembly DL$		35,000
Assembly OH	167.88%	58,757
Tooling DL$		18,000
Tooling OH	173.60%	31,248
Product “A” DL$		6,000
Product “A” OH	111.31%	6,679
Off-site DL$		2,000
Off-site OH	68.50%	1,370
Direct Materials		500,000
Material Handling	10.89%	54,447
Total Cost Input		$ 1,072,347

Exhibit 7. Contract “A” Estimated Costs

Assume that a defense cost-type contract, including some Product A input, had the estimated direct labor and materials content as shown in Exhibit 7, “Contract A Estimated Costs.” The application of the overhead rates to the direct costs would be made by multiplying the appropriate overhead rates times the estimated direct costs. Note that the Product B overhead rate is not applied to this contract. The overhead rates are applied only if the applicable direct cost used as a base for allocating overhead was used on that particular contract.

If the estimate of projected direct allocation base is too high, too little indirect cost will have been applied to contracts. If the estimate of projected allocation base is too low, too much indirect cost will have been applied. In addition, the actual indirect cost incurred in each overhead pool will realistically always be greater or less than estimated costs. Therefore, the actual indirect costs incurred will always differ from the amount of indirect costs applied to contracts. When actual costs are less than applied costs, overhead is said to be overapplied or overabsorbed. When actual costs are greater than applied costs, overhead is said to be underapplied or underabsorbed. If the differences are not a significant amount, overapplied or underapplied overhead would be credited or charged to profit in the current year. However, if the amounts involved are significant, they would be assigned to the cost of sales and inventory in the proportions in which the costs during the year have been assigned to cost of sales and inventory.

We will discuss the comparison of actual and applied overhead costs later in more detail when we discuss how industry uses the technique of variance analysis for overhead cost control purposes. To ensure that over- and underapplied amounts are kept to a minimum, predetermined applied overhead rates are revised during the

year if there are significant changes in business volume projections or in actual indirect expenses.

The reader should keep in mind that the objective of cost allocation is to logically link the indirect costs in each cost pool to the direct cost allocation base. There should be a high correlation between the direct cost allocation measure and the indirect costs in the overhead pool. In order to accomplish a linkage, indirect costs should be allocated in a proportionate amount to the job or contract that caused the indirect cost to be incurred. Therefore, the direct allocation base should be a primary cost driver or the work activity that causes overhead costs to be incurred. If a causal connection cannot be made, some other criterion, such as benefits received, should be substituted. Certainly, the allocation of overhead cost is not an exact science and the methods of allocation can vary significantly with contractors, but the method used should give an equitable assignment of overhead to the various products produced.

There are many direct allocation bases that have proven to be acceptable for fairly distributing overhead costs. The following are commonly found in industry: direct labor dollars, direct labor dollars plus fringe benefits, direct labor hours, direct materials, prime cost (materials and labor), units produced, machine hours, meter readings, floor space, and cubic content. Employee head count is sometimes used to distribute costs such as personnel department costs, payroll department costs, cafeteria losses, and medical department costs. Generally, a combination of several of these acceptable bases are used dependent upon the particular circumstances.

The direct labor dollars base is usually used when labor rates are relatively uniform and when labor costs are significant in relationship to total costs. The direct labor activity base is most often used, because the data are readily available from payroll and labor distribution records and the method is simple and economical. In some cases, fringe benefits are included as direct labor dollars as opposed to being included in the overhead cost pool. When this is done the overhead rate is dramatically reduced. For example, in Exhibit 6, if we include the engineering fringe benefits in the direct labor base, the engineering overhead rate is reduced from 125.95% to 52.67%. The numerator, or engineering overhead, is reduced by $88,827 and the direct labor base is increased by a like amount resulting in a revised engineering overhead pool of $144,243 and a revised base of $273,882. Although the overhead rate has been dramatically reduced, total costs have not changed.

Direct labor hours is a commonly accepted base for allocating overhead costs when the employees are interchangeable, such as that sometimes found in manufacturing operations. As an example, if assembly overhead was based on direct labor hours instead of direct labor dollars as shown in Exhibit 6, and the number of direct labor hours estimated to be worked in assembly for the next year was 5,500,000 hours, the assembly overhead rate would be $31.78 per direct labor hour. If the skills required on various contracts within a manufacturing operation vary significantly, the direct labor hour method may not be appropriate.

The use of machine hours as the basis for allocating manufacturing related indirect costs may be appropriate when machinery is heavily utilized in production operations. The current manufacturing trend toward the use of robotics and numerically controlled production equipment significantly increases the use of machines on the factory floor. Unfortunately, machine hours have not been as readily available in the past as direct labor hours for use in allocating overhead costs. However, management atten-

tion is being given to this area throughout industry and there is an increasing use of machine hours as an acceptable allocation base. If machine hours was used as the basis of allocation for fabrication overhead as shown in Exhibit 6 and it is assumed that 38 million machine hours were forecast for the year, the fabrication overhead rate would be $12.09 per machine hour. One would expect future increases in the use of machine hours as an overhead allocation base, given the increased level of automation with an attendant reduction in direct labor as a significant cost of production. Some companies, particularly in the electronics manufacturing area, have experienced this reduction to such a degree that direct labor now represents less than five percent of product cost.

Material handling costs may be allocated based on the physical quantity of direct materials as opposed to the dollar value of the material. Also, more than one material handling rate is often found, particularly when high value materials or subcontracts require procurement processes separate from those required for lower priced, high-volume materials. The average cost or units produced method is one of the simplest methods of overhead cost allocation, as it merely distributes the costs equally to each unit of product produced during the period. However, if the products vary in size, weight, dimensions, or require different amounts of material or time to produce, this method results in an inaccurate allocation of overhead costs. For government contractors the method of allocation must be consistent with the Federal Acquisition Regulations and the Cost Accounting Standards. We will discuss this further when we address specific government requirements affecting the allocation of indirect costs. Again, the primary objective in selecting a base is to use the method that most equitably allocates costs to all work, government and commercial.

Although good accounting practices promote consistency, changes still may need to be made once accurate allocation bases are selected. If the nature of an indirect cost pool or allocation base changes substantially (for example, because of the introduction of new products, manufacturing processes, or organizational structure changes), the existing methods of allocating indirect costs may require reevaluation and change.

ALLOCATION OF GENERAL AND ADMINISTRATIVE EXPENSES

Cost allocation relating to G&A expenses accounts for one of the major differences between commercial and government contracting. In the commercial world, general and administrative expenses are typically not allocated to contracts but are considered to be period expenses that are written off to cost of sales each year. However, for government contracting purposes, if contractors did not allocate general and administration expenses to contracts, they would be unable to recover their actual total cost, even on cost-type contracts. It is important to note that G&A is called out as a separate line item on government cost performance reports (CPRs), which relate to specific contracts.

Since G&A, by definition, represents the expenses for the general management and administration of the business segment as a whole, the G&A cost allocation base should be one that represents the total activity of the business segment. If an expense is included in G&A and does not relate to the total activity of the business, then a question is raised as to why it should not be taken out of G&A and be allocated separately. The most commonly used base for allocating G&A is total cost input. Total cost input, a term seldom used outside of the government contracting world, is defined as all costs except those in the G&A cost pool.

Exhibit 8, "Computation of the G&A Rate," shows how the total G&A cost pool is determined after a transfer of IR&D/B&P expenses has been made to the G&A cost pool. IR&D/B&P projects must be accounted for on the same basis as if the work was being done under contract. That is, the projects must have a fair share allocation of all applicable overhead cost added to the direct costs of the projects. The total direct and indirect costs for IR&D/B&P projects are then added to the G&A cost pool. The G&A rate, thus determined based on total cost input as shown in Exhibit 8, would be 12.24%. Applying this rate to Exhibit 9, "Contract A Estimated Costs," the appropriate allocation of G&A to the contract would be $131,262. The logic of including IR&D/B&P in the G&A cost pool is that this cost, like general and administration expenses, relates to the operation of the business segment as a whole. In other words, IR&D and B&P expenses are not G&A expenses but are indirect expenses that must be allocated on the same base as G&A. Many defense contractors chose to have a separate IR&D/B&P cost pool. If so, it must be allocated on the same basis as the G&A pool.

Bases that are often used for allocation of G&A expenses are total cost input, value added cost input (total cost input minus direct materials and subcontracts), and the single element of direct labor. Although the cost of goods sold or cost of sales base is often used in some businesses for allocating G&A type expenses, this base cannot be used for government contractors that are subject to cost accounting standard requirements. There are very stringent requirements regarding the accounting for general and administrative expenses for government contracting purposes and we will discuss them further when we discuss CAS 403, Allocation of Home Office Expenses, and CAS 410, Allocation of General and Administrative Expenses. Again, the accounting for G&A represents one of the most controversial areas in government contracting.

The term "wrap rate" is sometimes used by defense contractors to indicate the total cost or "all-up" rate including overhead and G&A. For example, assume that direct labor dollars is the allocation base for engineering overhead and total cost input is the base for G&A. If the engineering overhead rate is 125% and the G&A rate is 25%, the wrap rate or "all-up" rate for engineers with an average hourly rate of $25 would be $70.31. Contractors often track wrap rates from year to year for competitive analysis and management control purposes. Wrap rates usually do not include direct materials, subcontracts, and materials handling, since the content of these costs may be highly variable for a given contract.

Although overhead and general and administrative rates of different companies are often compared, as an indicator of efficiency, any such comparison is of questionable value. A high rate does not necessarily indicate that indirect costs are out of control nor does a low rate indicate efficiency. In fact, a high overhead rate could be the result of a contractor having the latest and most efficient manufacturing processes in his plant versus a contractor who is operating with antiquated equipment and consequently is using an excessive amount of direct labor, which could cause the overhead rate to be low if the rate was based on a direct labor allocation base. As previously discussed, an overhead rate merely represents the relationship between one number, the indirect cost pool, and another, the selected allocation base. Although the numerator is always expressed in dollars of indirect costs, the type and number of indirect cost pools vary significantly by contractor, and the allocation bases also vary. For example, one contractor may have his receiving and inspection functions included in his manufacturing overhead pool and another may

G&A Cost Pool:			
G&A Expenses (Exhibit 4)			$ 221,076
IR&D/B&P Projects:			
Engineering Direct Labor		$ 69,600	
Engineering Overhead	125.95%	87,658	
Fabrication Direct Labor		3,900	
Fabrication Overhead	210.11%	8,194	
Tooling Direct Labor		1,450	
Tooling Overhead	173.60%	2,517	
ODC		543	
Direct Materials		3,625	
Material Handling	10.89%	395	
Total IR&D/B&P Costs			$ 177,883
Total G&A Expenses			$ 398,959

G&A Allocation Base—Total Cost Input:

	Total Cost	**Less IR&D/B&P**	**Total Cost Input**
Engineering Direct Labor	$ 185,955	$ 69,600	$ 115,455
Engineering Overhead	233,070	87,658	145,411
Fabrication Direct Labor	218,597	3,900	214,697
Fabrication Overhead	459,294	8,194	451,099
Assembly Direct Labor	104,094		104,094
Assembly Overhead	174,748		174,748
Tooling Direct Labor	24,289	1,450	22,839
Tooling Overhead	42,165	2,517	39,648
Direct Materials	1,693,812	3,625	1,690,187
Material Handling	184,445	395	184,050
ODC	31,450	543	30,907
Product ”A“ Direct Labor	11,566		11,566
Product ”A“ Overhead	12,874		12,874
Product ”B“ Direct Labor	23,132		23,132
Product ”B“ Overhead	23,966		23,966
Off-Site Direct Labor	8,674		8,674
Off-Site Overhead	5,942		5,942
Total	$ 3,437,172	$ 177,883	$ 3,259,290
G&A Rate			12.24%

Exhibit 8. Computation of G&A Rate

Engineering DL$		$ 60,000
Engineering OH	125.95%	75,568
Fabrication		72,000
Fabrication OH	210.11%	151,279
Assembly DL$		35,000
Assembly OH	167.88%	58,757
Tooling DL$		18,000
Tooling OH	173.60%	31,248
Product ”A“ DL$		6,000
Product "A“ OH	111.31%	6,679
Off-Site DL$		2,000
Off-Site OH	68.50%	1,370
Direct Materials		500,000
Material Handling	10.89%	54,447
Total Cost Input		$ 1,072,347
General & Admin Expenses	12.24%	131,262
Total Costs		$ 1,203,609

Exhibit 9. Contract “A” Estimated Costs

have similar functions included in his materials handling pool. The overhead allocation base could include fringe benefits for one contractor while such costs are included in overhead for another.

Contractors differ in the type of products they produce, ownership of facilities, tooling and equipment used, amount of government furnished equipment, the number and types of government programs, company make-versus-buy programs, and organizational structure. All of these differences will significantly impact overhead and G&A rates.

Another complicating factor that makes the comparison of overhead rates an almost meaningless exercise is that many companies follow a practice of prorating or directly distributing certain types of costs as direct costs; other contractors may consider the same costs to be overhead. For example, administrative or indirect labor in engineering may be distributed to jobs based upon the pure engineering direct labor hours worked by the supported engineering organization. This practice has a tremendous impact upon reducing overhead rates: the numerator is reduced because indirect labor is taken out of the cost pool and at the same time the denominator is increased as the direct cost allocation base is increased. There is tremendous flexibility in accounting systems and in direct versus indirect classifications. Before any meaning-

ful analysis of overhead costs is undertaken, one must thoroughly understand each contractor's accounting and indirect cost allocation methods.